FIG. 1

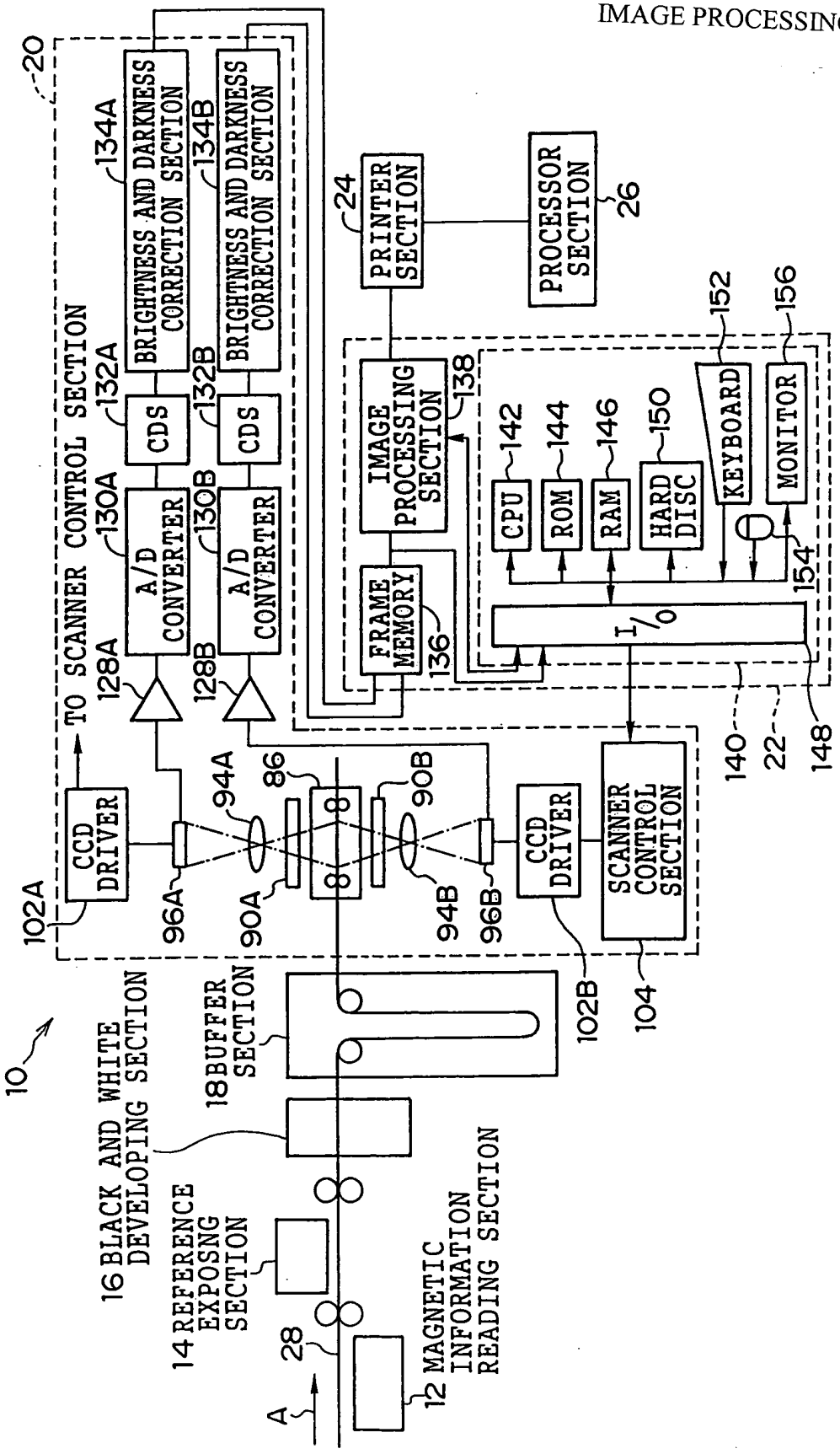

10
12 MAGNETIC INFORMATION READING SECTION
14 REFERENCE EXPOSNG SECTION
16 BLACK AND WHITE DEVELOPING SECTION
18 BUFFER SECTION
20
TO SCANNER CONTROL SECTION
22
24 PRINTER SECTION
26 PROCESSOR SECTION
28
A
86
90A
90B
94A
94B
96A
96B
102A
102B
104
128A
128B
130A
130B
132A
132B
134A
134B
136
138
140
142 CPU
144 ROM
146 RAM
148
150 HARD DISC
152 KEYBOARD
154
156 MONITOR
A/D CONVERTER
BRIGHTNESS AND DARKNESS CORRECTION SECTION
CCD DRIVER
CDS
FRAME MEMORY
I/O
IMAGE PROCESSING SECTION
SCANNER CONTROL SECTION

FIG. 2

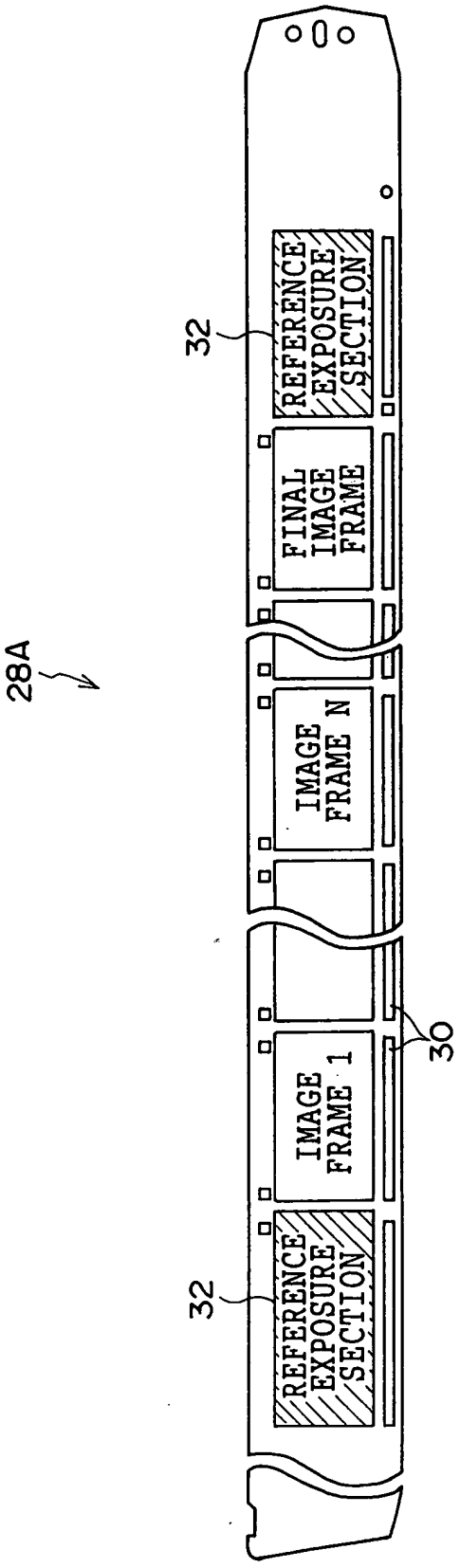

28A
32
REFERENCE EXPOSURE SECTION
FINAL IMAGE FRAME
IMAGE FRAME N
IMAGE FRAME 1
30
32
REFERENCE EXPOSURE SECTION

FIG. 3

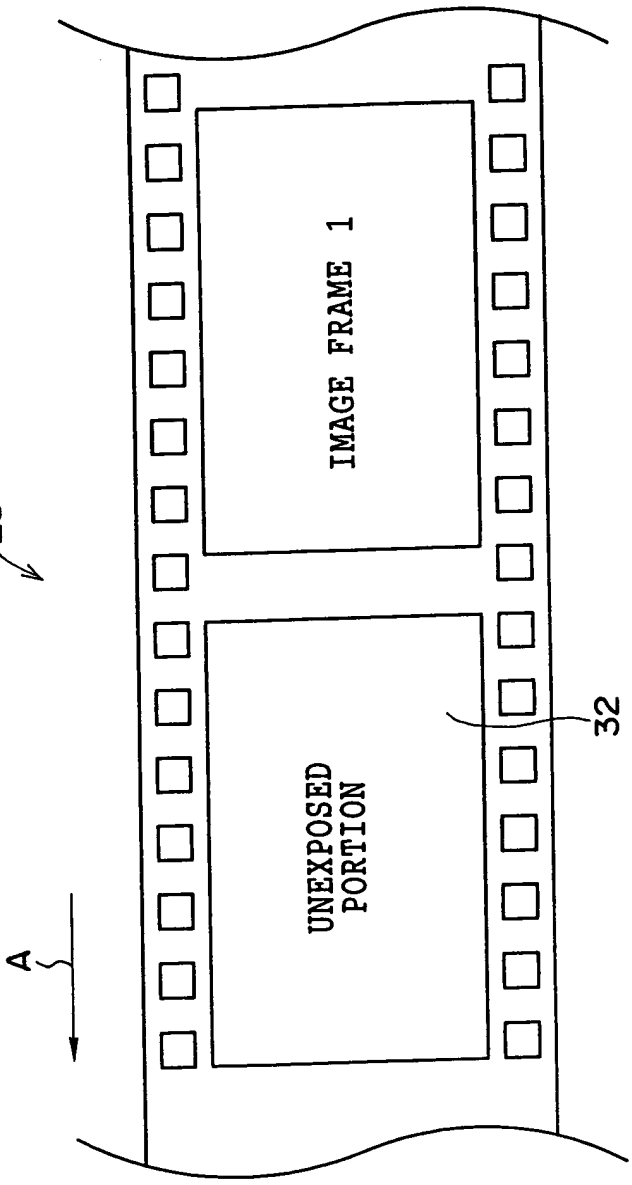


FIG. 4

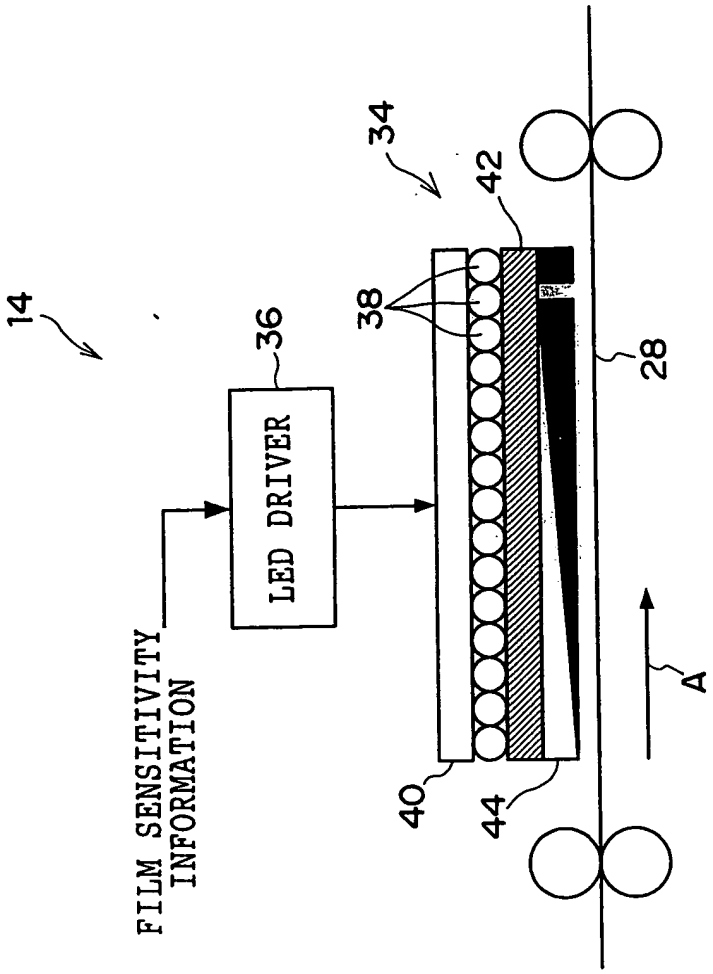

14
36
LED DRIVER
FILM SENSITIVITY INFORMATION
38
34
42
28
40
44
A

FIG. 5

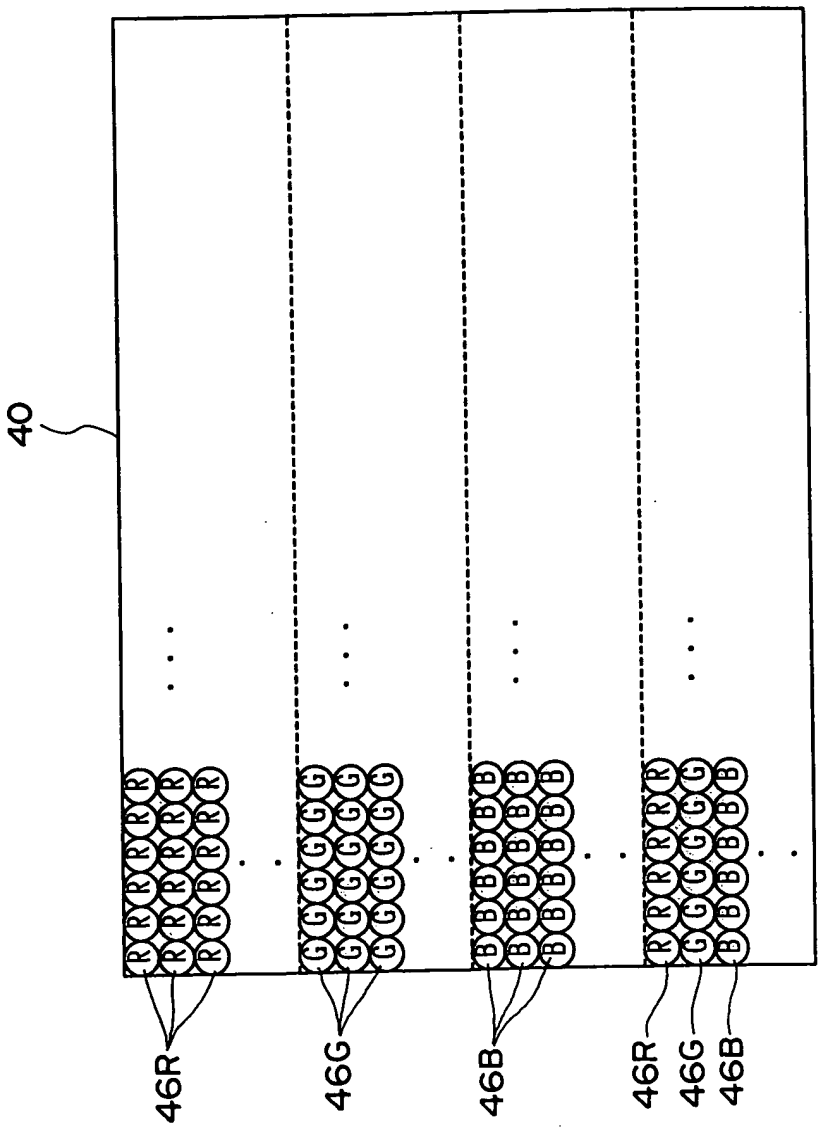


FIG. 6

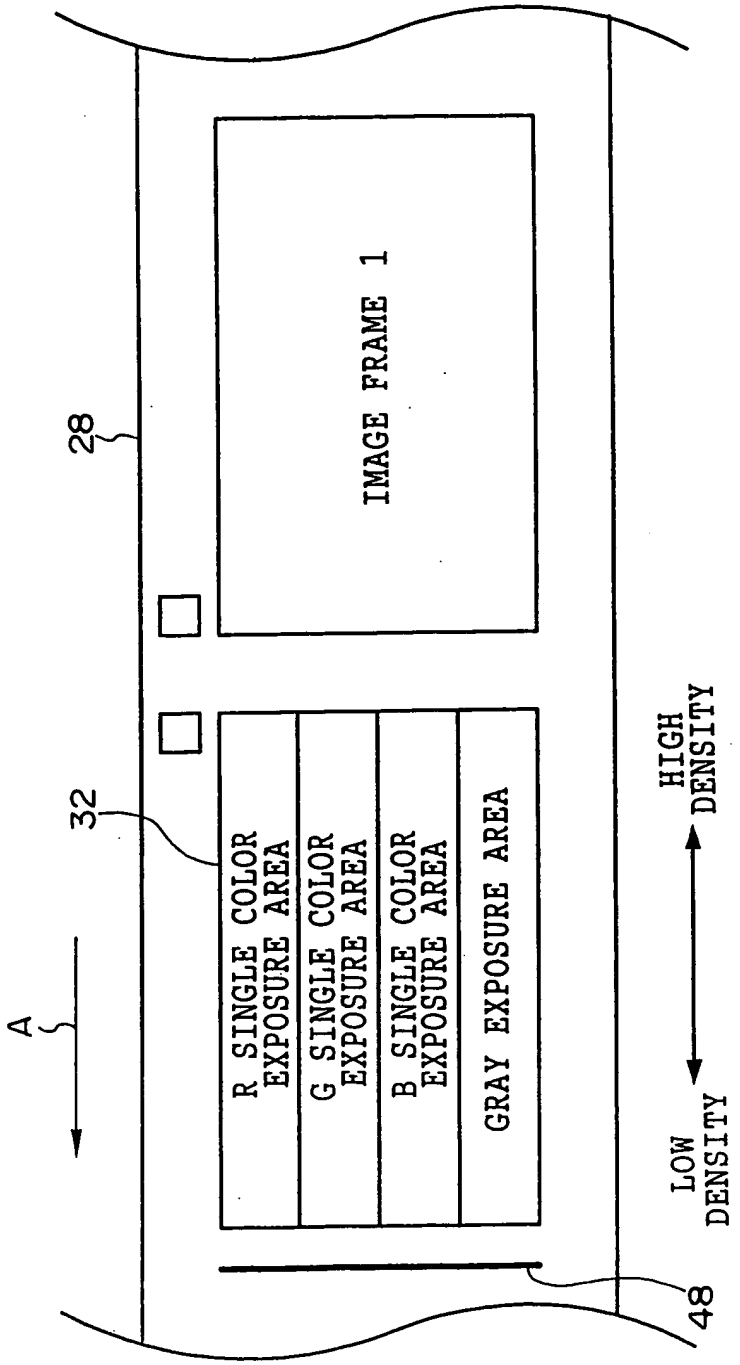

28
IMAGE FRAME 1
32
R SINGLE COLOR EXPOSURE AREA
G SINGLE COLOR EXPOSURE AREA
B SINGLE COLOR EXPOSURE AREA
GRAY EXPOSURE AREA
A
HIGH DENSITY
LOW DENSITY
48

FIG. 7

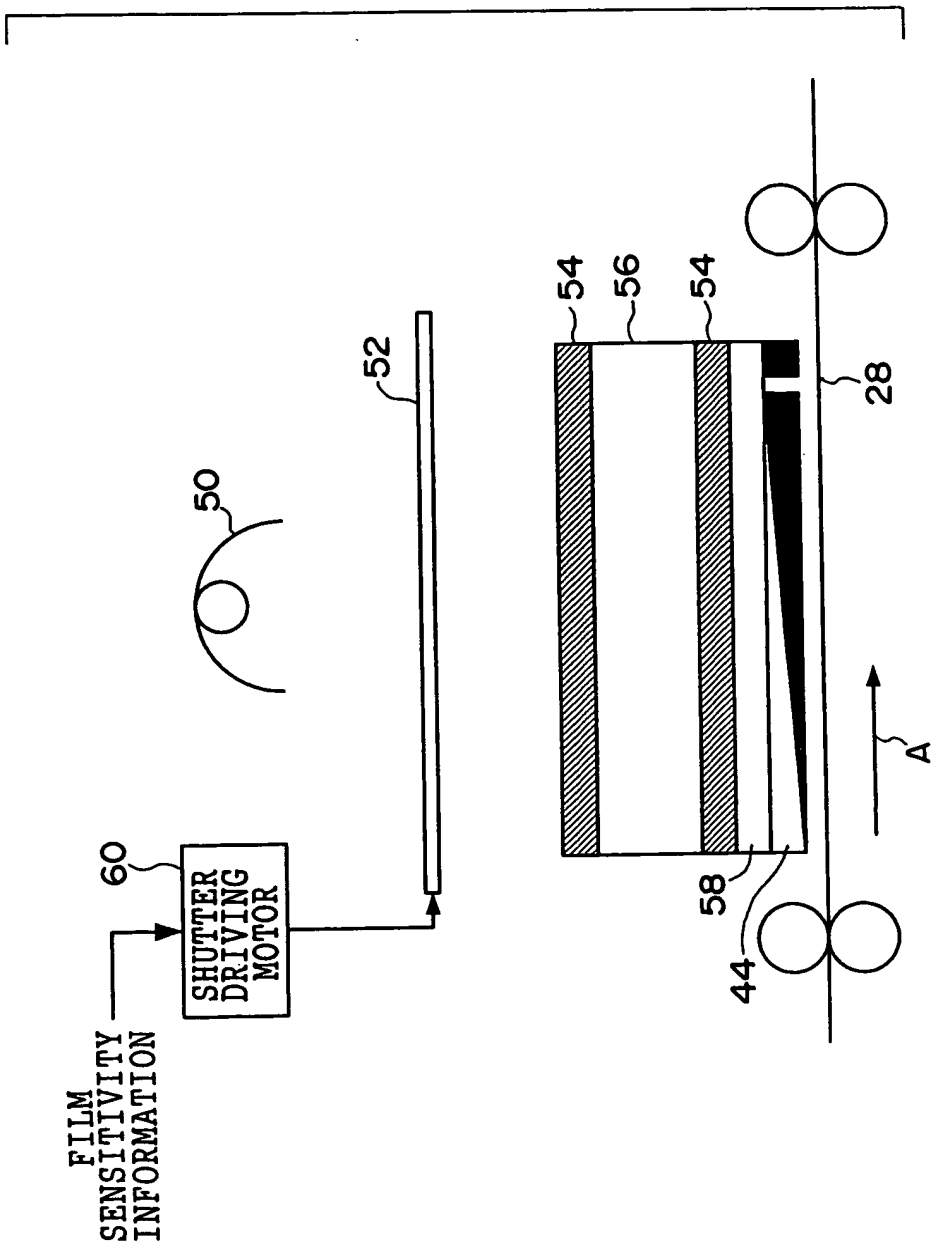

54
56
54
28
52
50
60
SHUTTER DRIVING MOTOR
FILM SENSITIVITY INFORMATION
58
44
A

FIG. 8

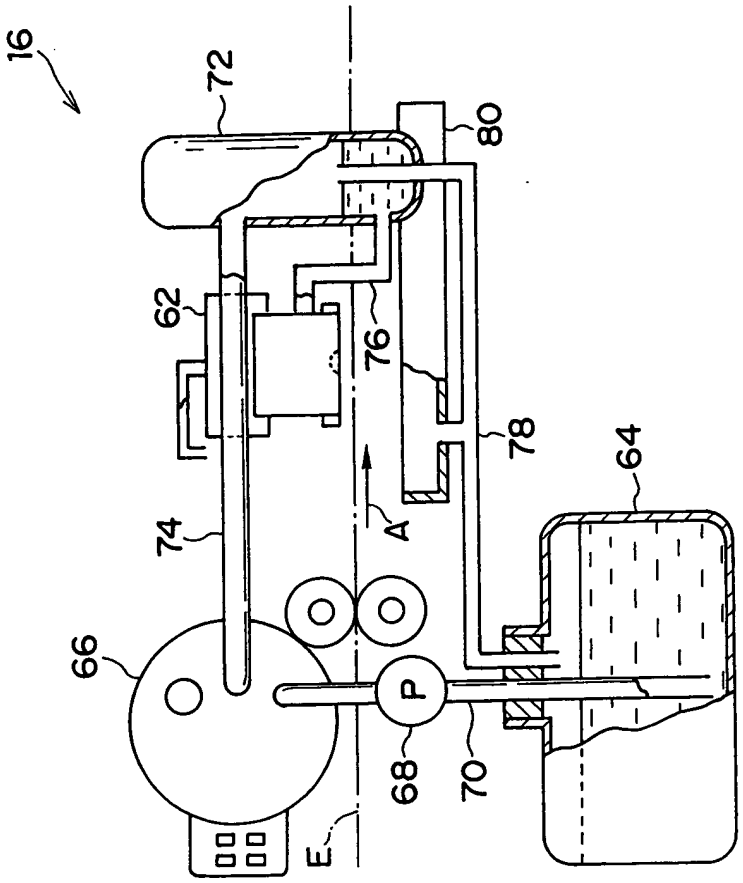


FIG. 9

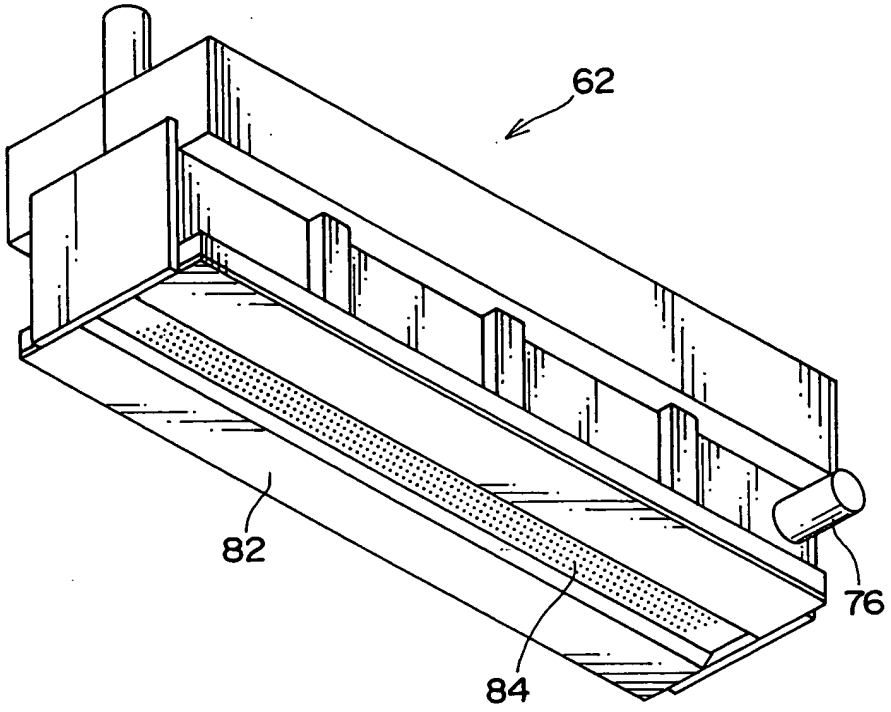


FIG. 10

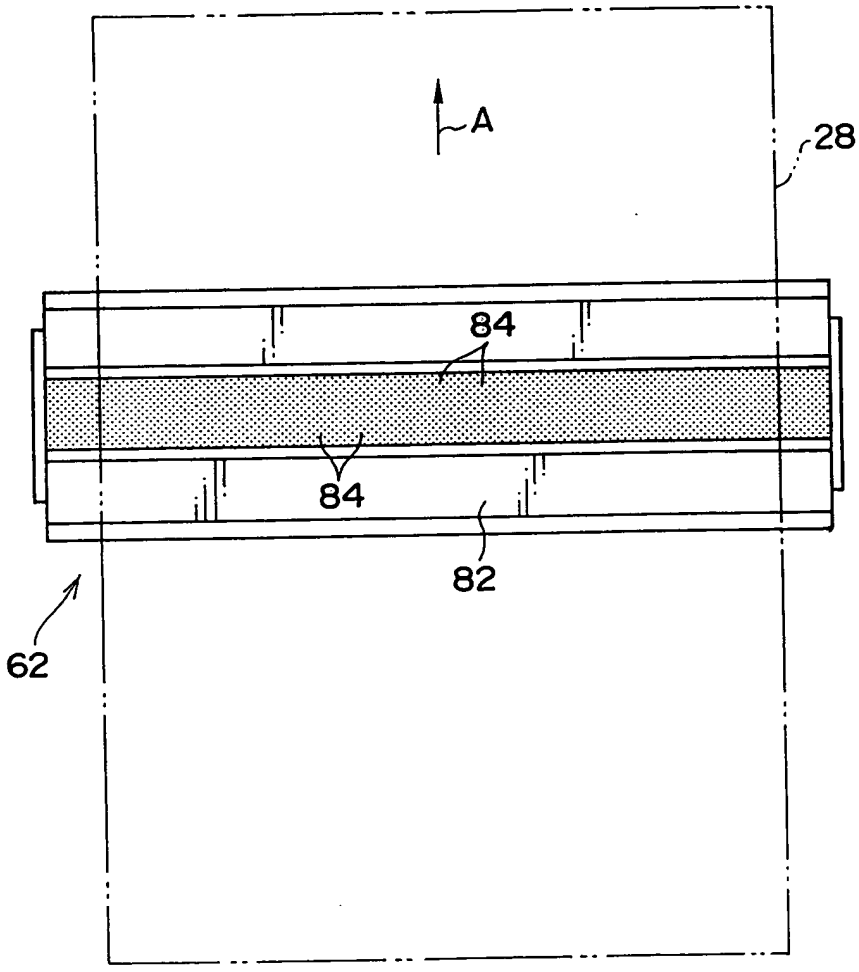


FIG. 11

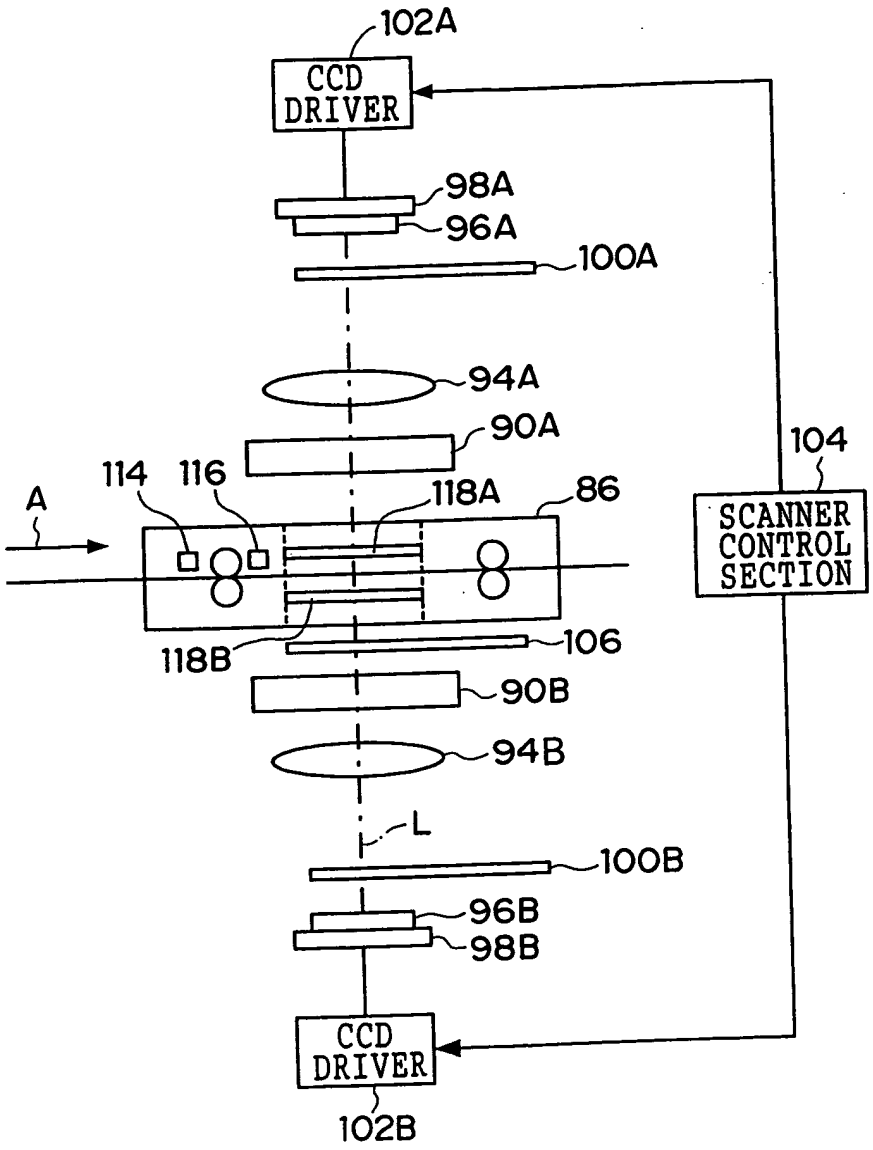

102A
CCD DRIVER
98A
96A
100A
94A
90A
104
114
116
118A
86
A
SCANNER CONTROL SECTION
118B
106
90B
94B
L
100B
96B
98B
CCD DRIVER
102B

FIG. 12A

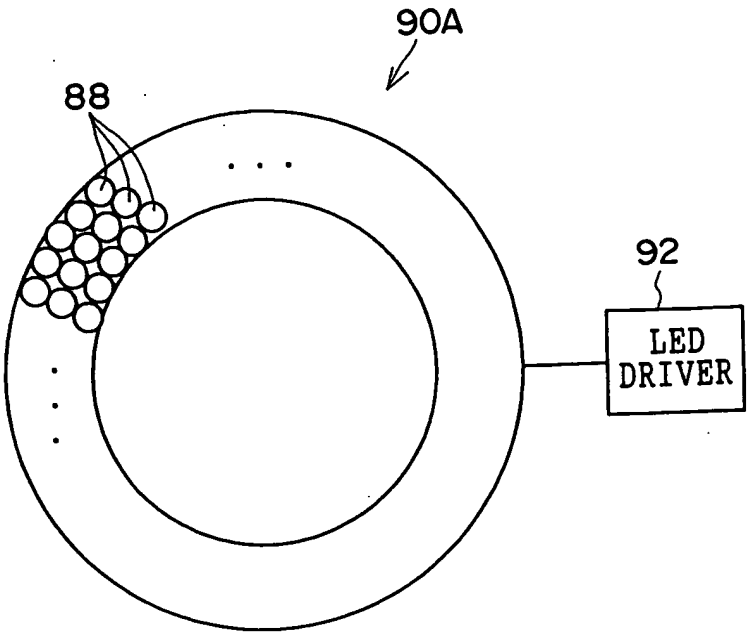


FIG. 12B

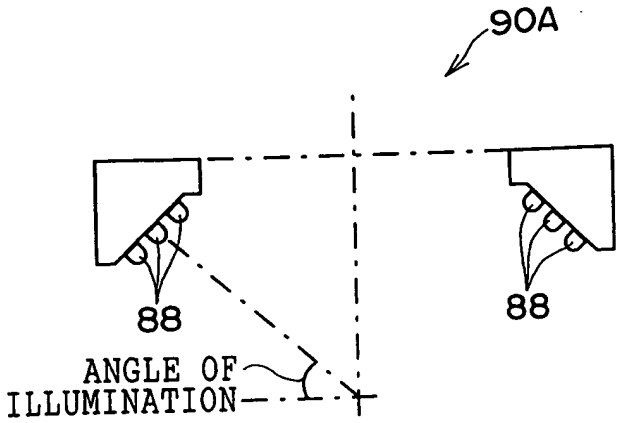


FIG. 13

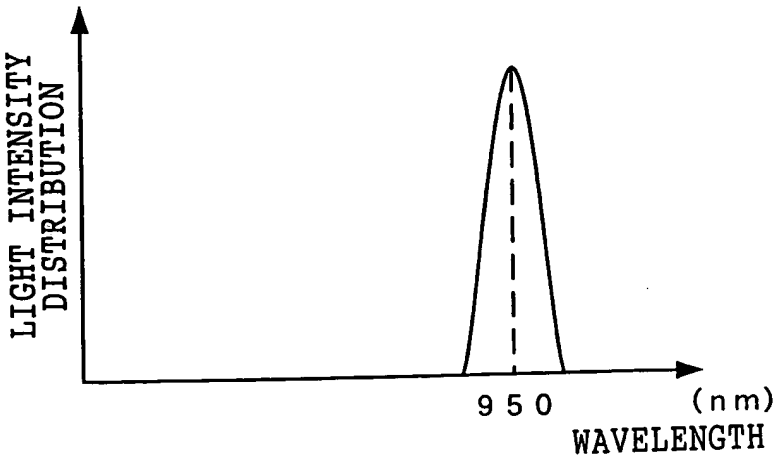


FIG. 14A

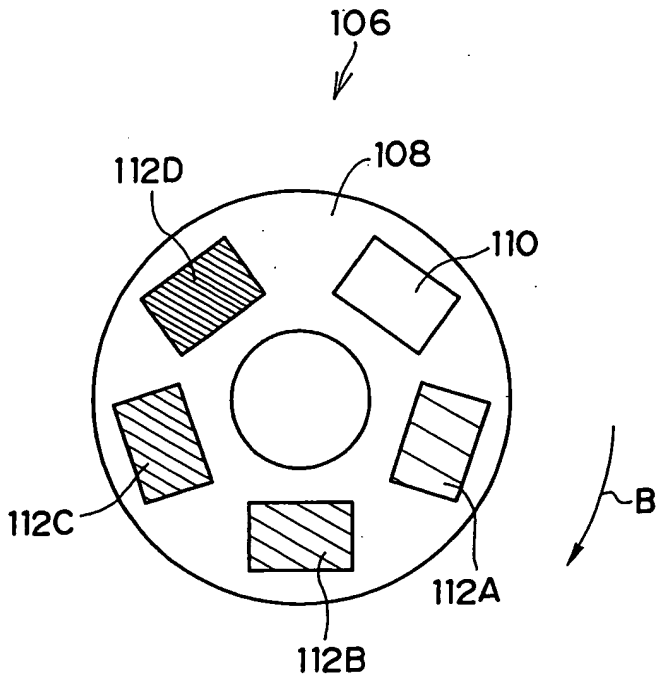


FIG. 14B

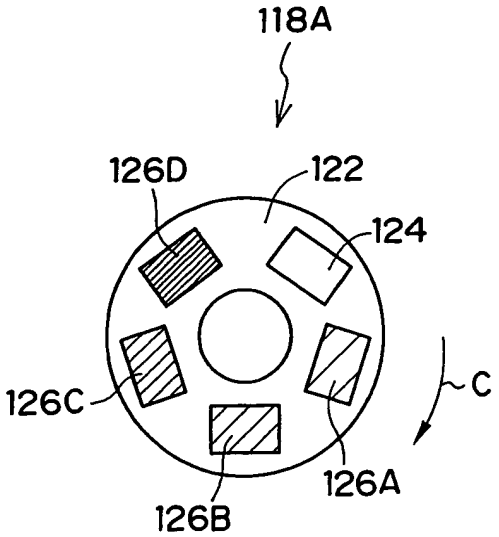


FIG. 15

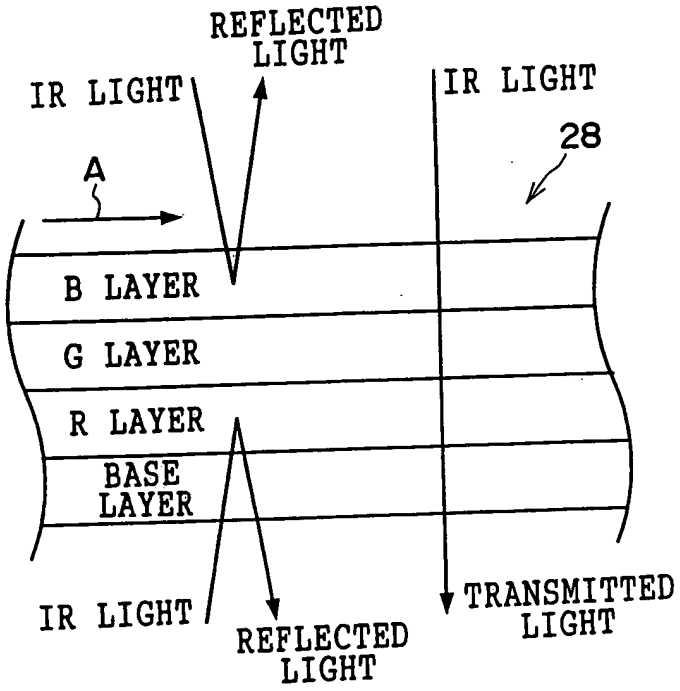

REFLECTED LIGHT
IR LIGHT
IR LIGHT
28
A
B LAYER
G LAYER
R LAYER
BASE LAYER
IR LIGHT
REFLECTED LIGHT
TRANSMITTED LIGHT

FIG. 16

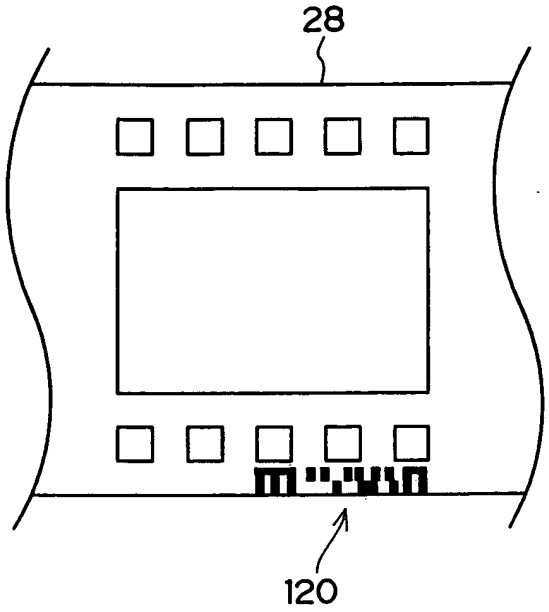


FIG. 17

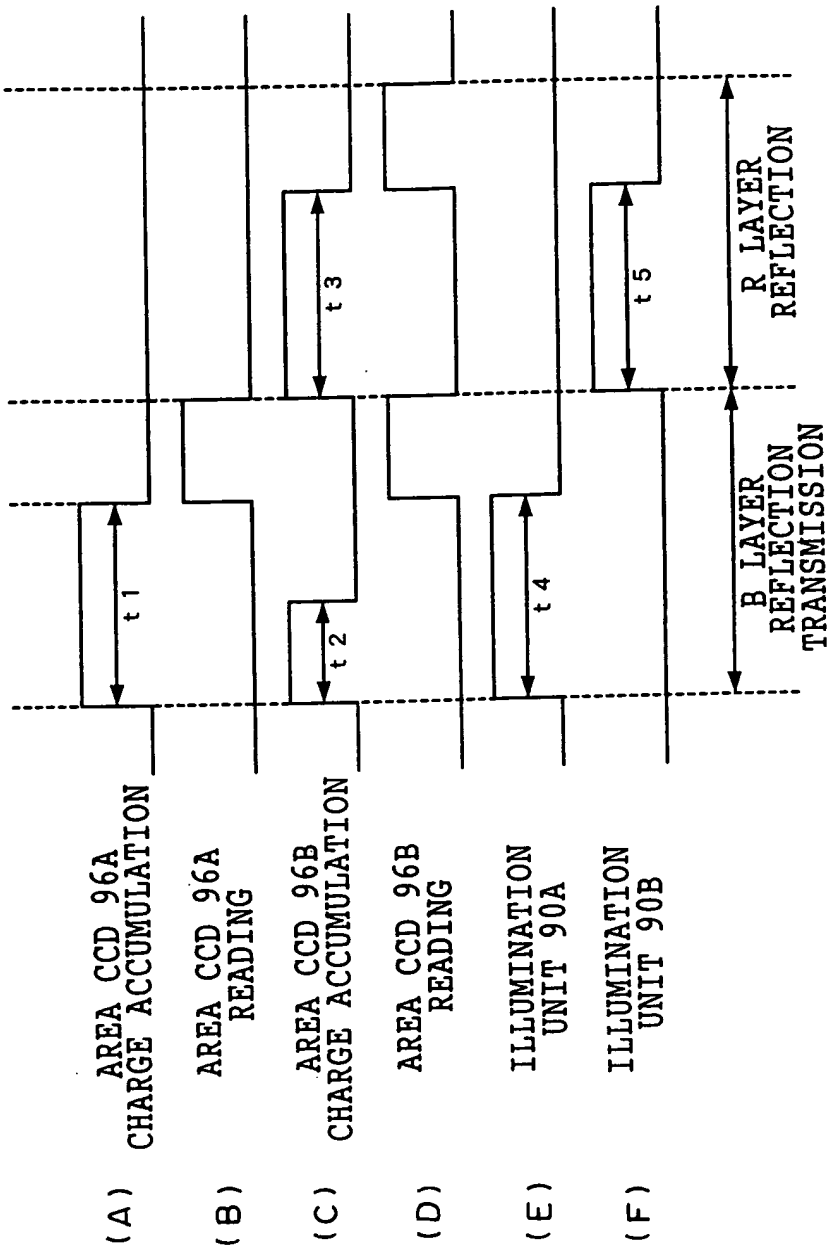

(A) AREA CCD 96A CHARGE ACCUMULATION
(B) AREA CCD 96A READING
(C) AREA CCD 96B CHARGE ACCUMULATION
(D) AREA CCD 96B READING
(E) ILLUMINATION UNIT 90A
(F) ILLUMINATION UNIT 90B
t1
t2
t3
t4
t5
R LAYER REFLECTION
B LAYER REFLECTION TRANSMISSION

FIG. 18

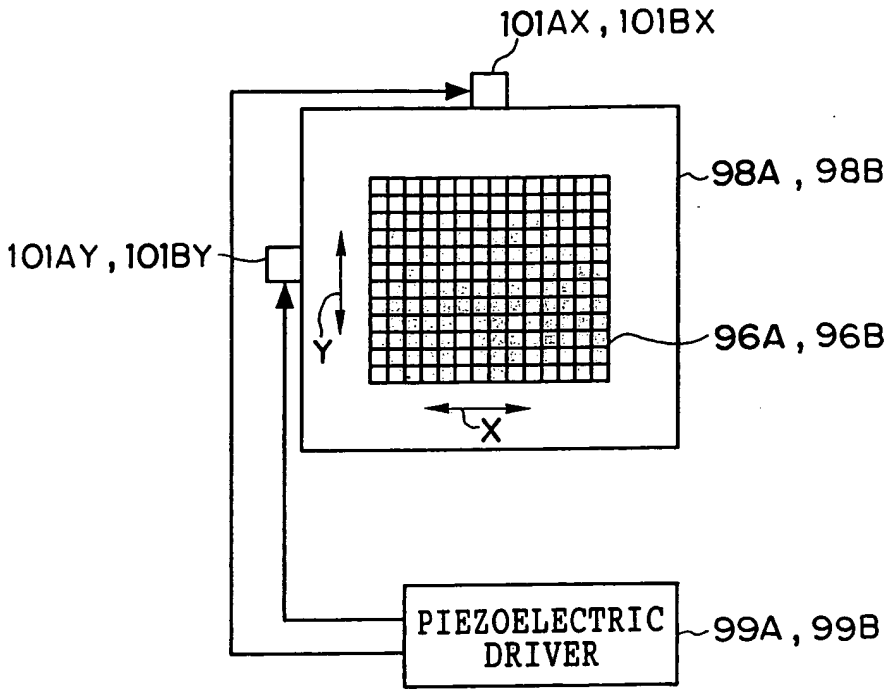

101AX, 101BX
98A, 98B
101AY, 101BY
Y
96A, 96B
X
PIEZOELECTRIC DRIVER
99A, 99B

FIG. 19

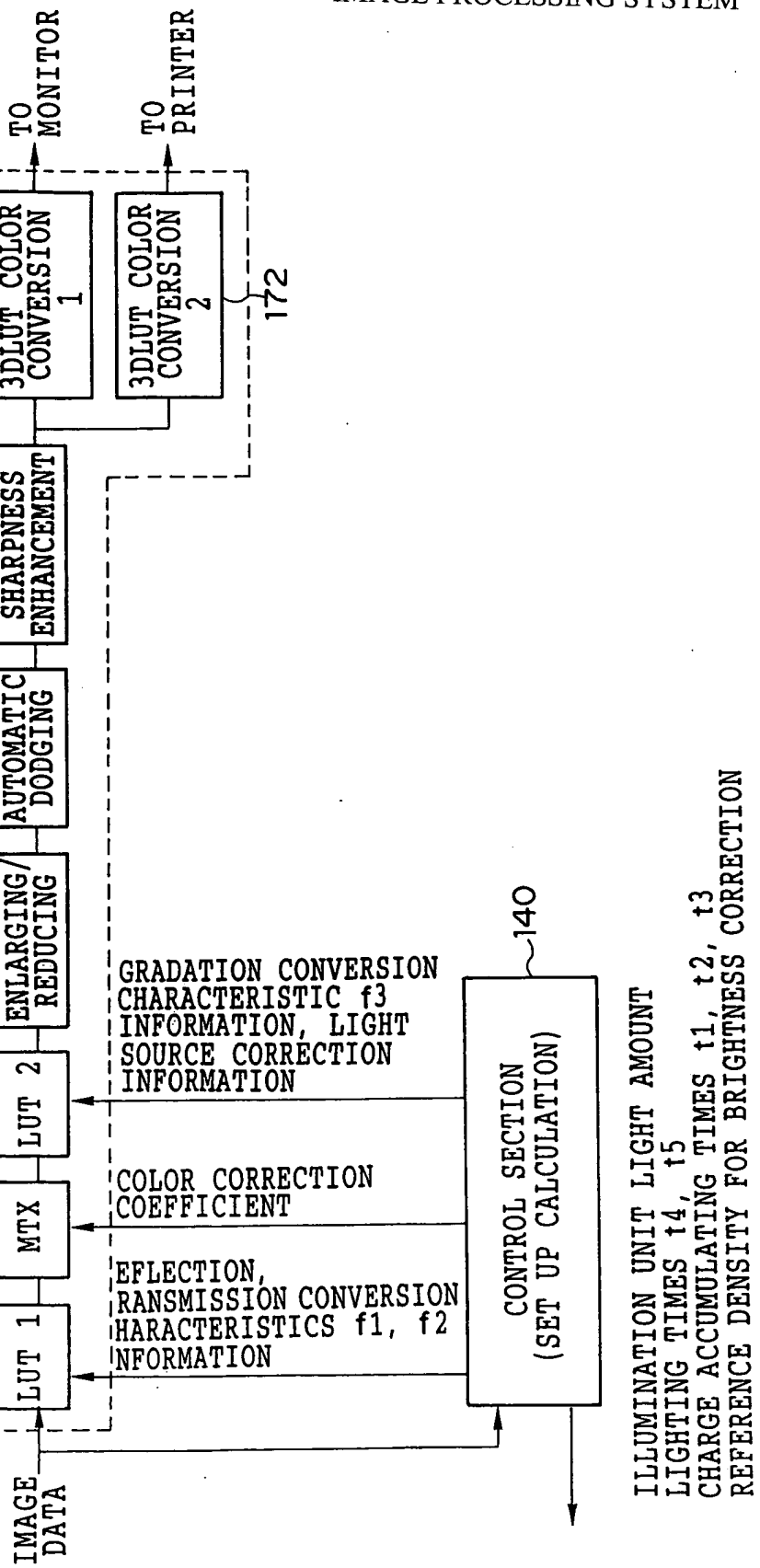

TO MONITOR
TO PRINTER
170
3DLUT COLOR CONVERSION 1
3DLUT COLOR CONVERSION 2
172
168
SHARPNESS ENHANCEMENT
166
AUTOMATIC DODGING
138
164
ENLARGING/ REDUCING
162
LUT 2
160
MTX
158
LUT 1
IMAGE DATA
GRADATION CONVERSION CHARACTERISTIC f3 INFORMATION, LIGHT SOURCE CORRECTION INFORMATION
COLOR CORRECTION COEFFICIENT
EFLECTION, RANSMISSION CONVERSION HARACTERISTICS f1, f2 NFORMATION
140
CONTROL SECTION (SET UP CALCULATION)
ILLUMINATION UNIT LIGHT AMOUNT
LIGHTING TIMES t4, t5
CHARGE ACCUMULATING TIMES t1, t2, t3
REFERENCE DENSITY FOR BRIGHTNESS CORRECTION

FIG. 20

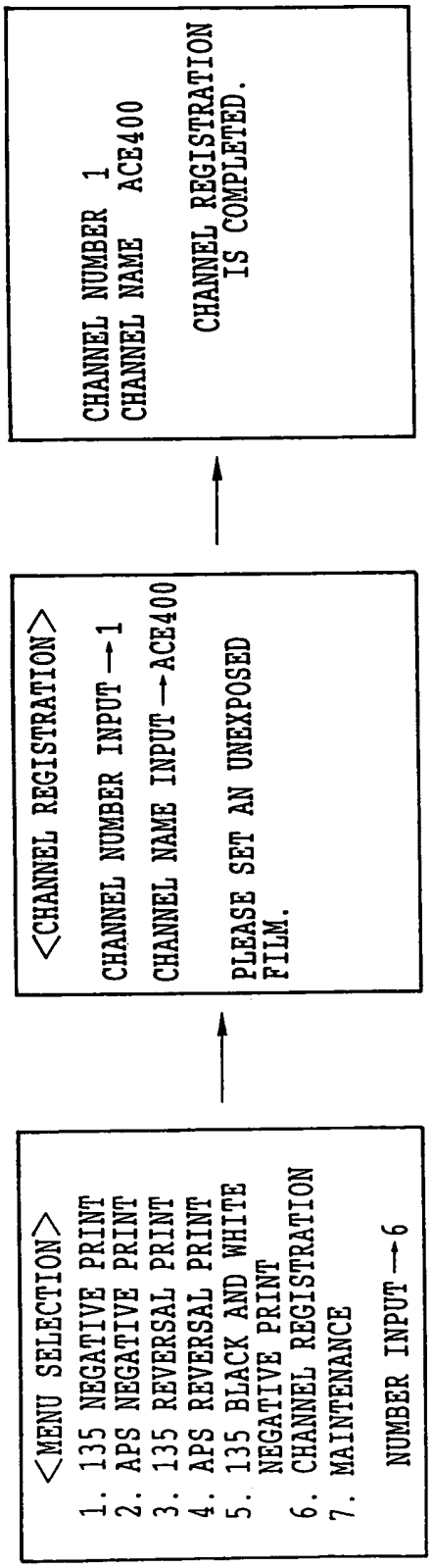

<MENU SELECTION>
1. 135 NEGATIVE PRINT
2. APS NEGATIVE PRINT
3. 135 REVERSAL PRINT
4. APS REVERSAL PRINT
5. 135 BLACK AND WHITE NEGATIVE PRINT
6. CHANNEL REGISTRATION
7. MAINTENANCE
NUMBER INPUT →6
<CHANNEL REGISTRATION>
CHANNEL NUMBER INPUT →1
CHANNEL NAME INPUT →ACE400
PLEASE SET AN UNEXPOSED FILM.
CHANNEL NUMBER 1
CHANNEL NAME ACE400
CHANNEL REGISTRATION IS COMPLETED.

FIG. 21

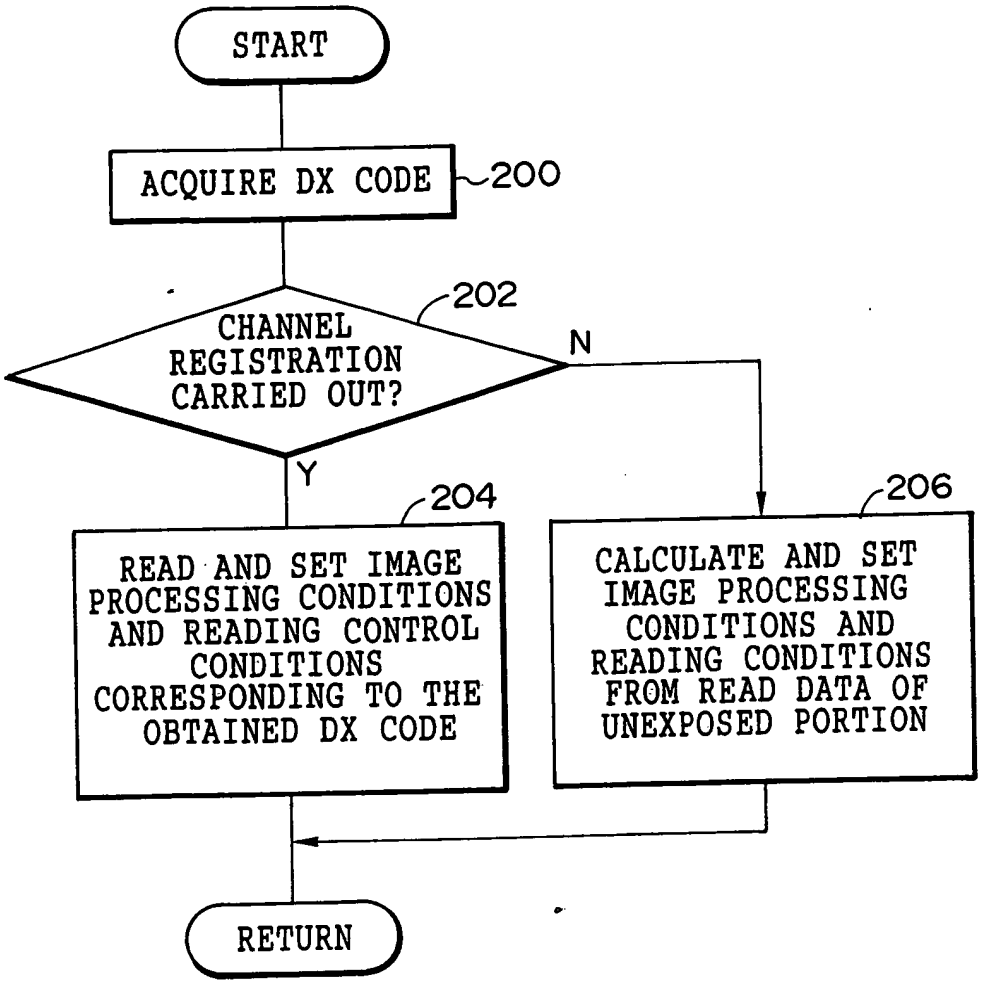

START
ACQUIRE DX CODE
200
CHANNEL REGISTRATION CARRIED OUT?
202
N
Y
READ AND SET IMAGE PROCESSING CONDITIONS AND READING CONTROL CONDITIONS CORRESPONDING TO THE OBTAINED DX CODE
204
CALCULATE AND SET IMAGE PROCESSING CONDITIONS AND READING CONDITIONS FROM READ DATA OF UNEXPOSED PORTION
206
RETURN

FIG. 22

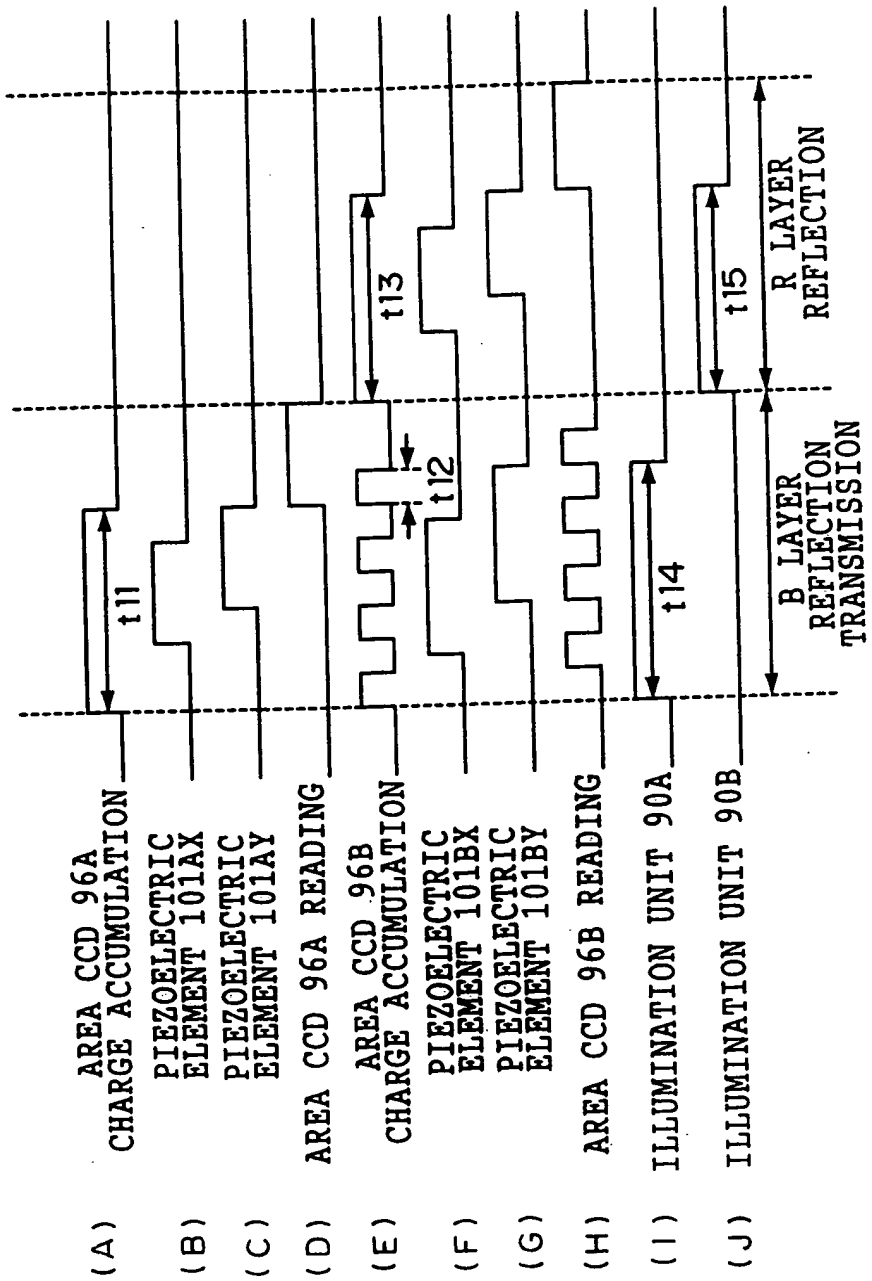

(A) AREA CCD 96A CHARGE ACCUMULATION
(B) PIEZOELECTRIC ELEMENT 101AX
(C) PIEZOELECTRIC ELEMENT 101AY
(D) AREA CCD 96A READING
(E) AREA CCD 96B CHARGE ACCUMULATION
(F) PIEZOELECTRIC ELEMENT 101BX
(G) PIEZOELECTRIC ELEMENT 101BY
(H) AREA CCD 96B READING
(I) ILLUMINATION UNIT 90A
(J) ILLUMINATION UNIT 90B
t11
t12
t13
t14
t15
R LAYER REFLECTION
B LAYER REFLECTION TRANSMISSION

FIG. 23

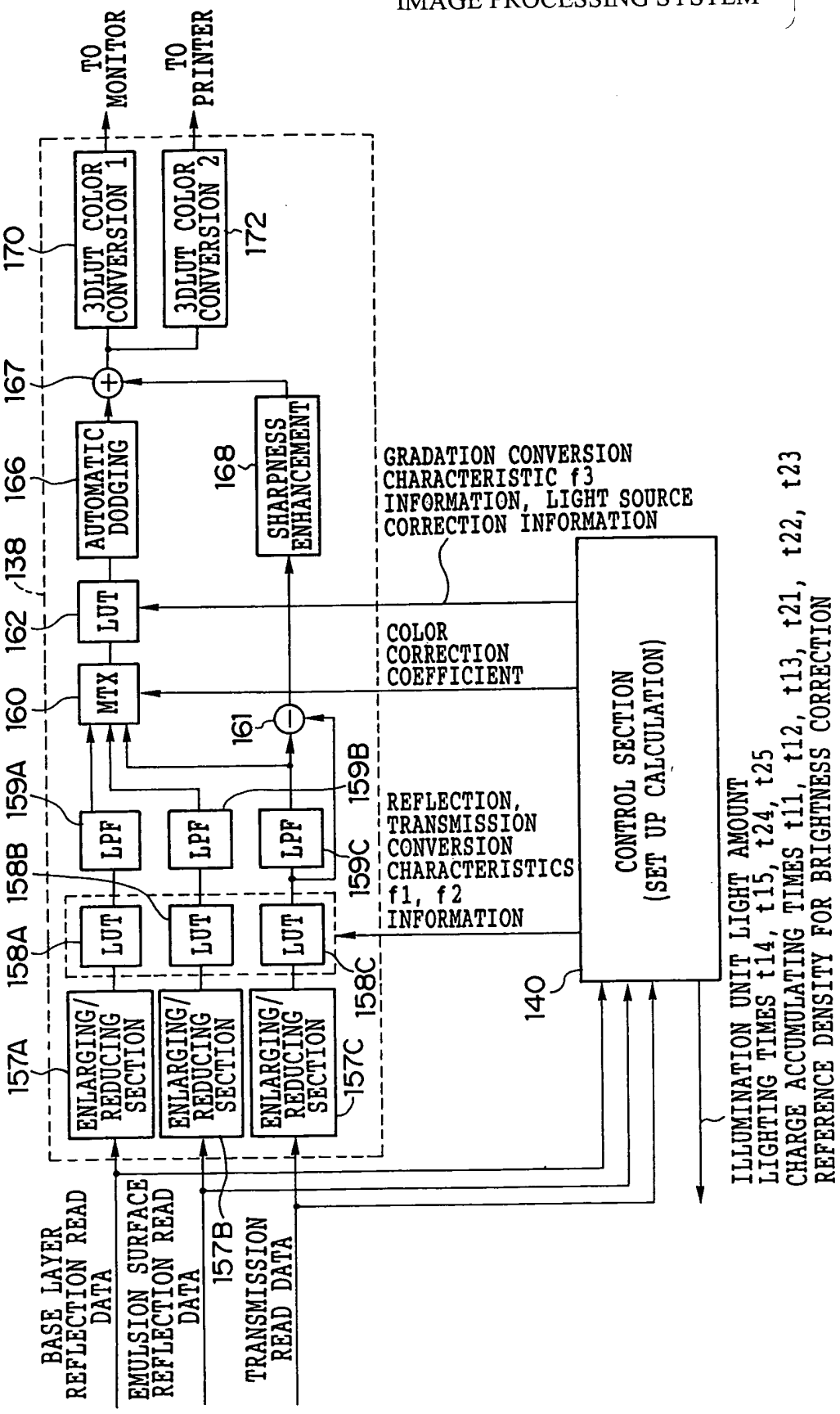

TO MONITOR
TO PRINTER
170
3DLUT COLOR CONVERSION 1
172
3DLUT COLOR CONVERSION 2
167
166
AUTOMATIC DODGING
168
SHARPNESS ENHANCEMENT
GRADATION CONVERSION CHARACTERISTIC f3 INFORMATION, LIGHT SOURCE CORRECTION INFORMATION
138
162
LUT
COLOR CORRECTION COEFFICIENT
160
MTX
161
159A
159B
LPF
LPF
LPF
REFLECTION, TRANSMISSION CONVERSION CHARACTERISTICS f1, f2 INFORMATION
158B
159C
158A
LUT
LUT
LUT
158C
CONTROL SECTION (SET UP CALCULATION)
140
157A
ENLARGING/ REDUCING SECTION
ENLARGING/ REDUCING SECTION
ENLARGING/ REDUCING SECTION
157C
ILLUMINATION UNIT LIGHT AMOUNT
LIGHTING TIMES t14, t15, t24, t25
CHARGE ACCUMULATING TIMES t11, t12, t13, t21, t22, t23
REFERENCE DENSITY FOR BRIGHTNESS CORRECTION
BASE LAYER REFLECTION READ DATA
EMULSION SURFACE REFLECTION READ DATA
157B
TRANSMISSION READ DATA

FIG. 24C

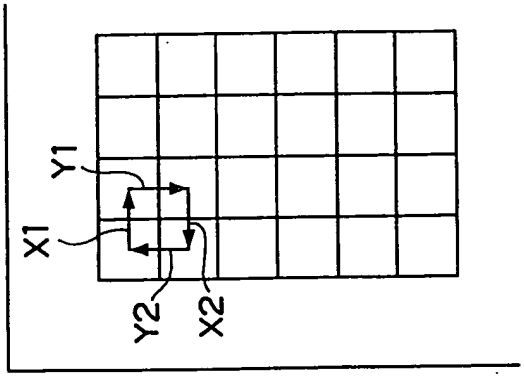


FIG. 24B

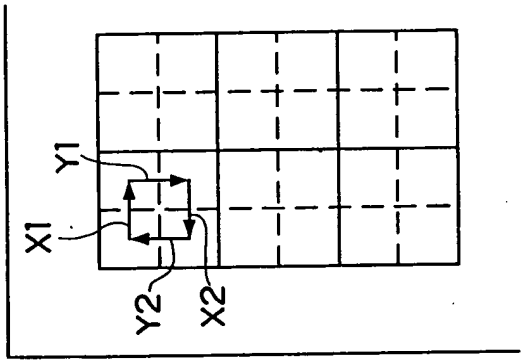


FIG. 24A

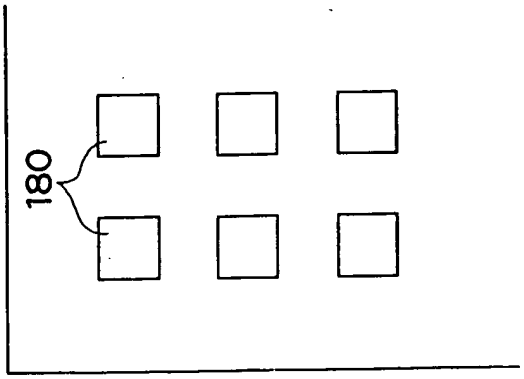


FIG. 25

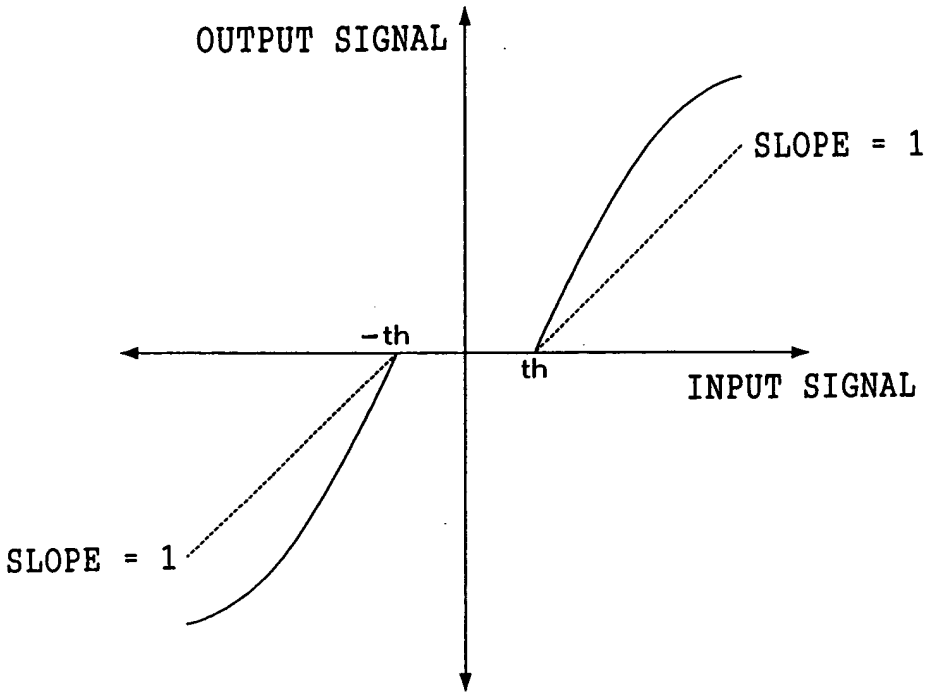


FIG. 26A

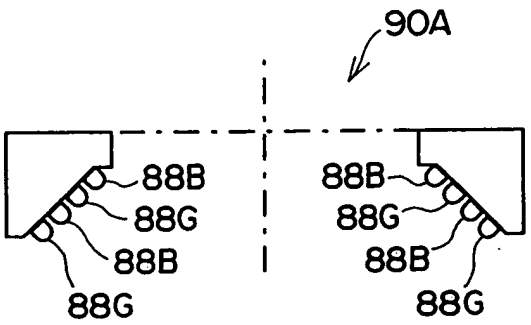


FIG. 26B

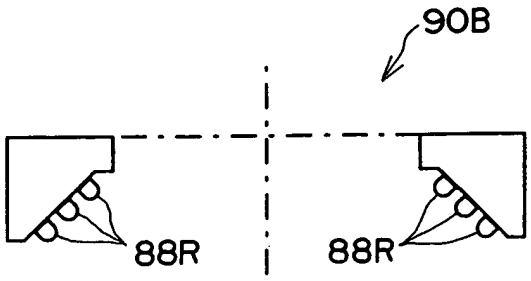


FIG. 27

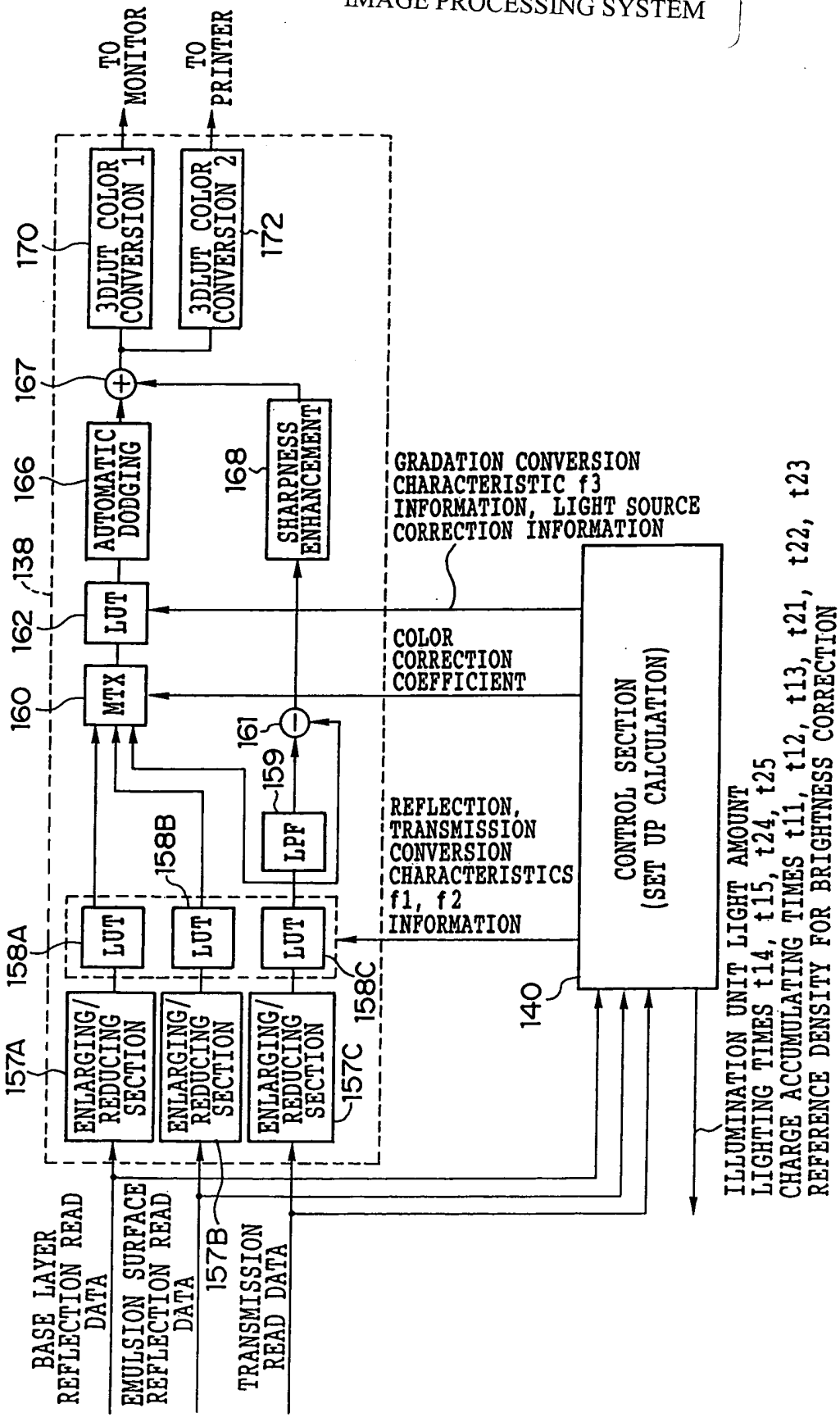

TO MONITOR
TO PRINTER
3DLUT COLOR CONVERSION 1
3DLUT COLOR CONVERSION 2
170
172
167
AUTOMATIC DODGING
166
SHARPNESS ENHANCEMENT
168
138
LUT
162
MTX
160
161
159
LPF
158B
158A
158C
157A
157C
157B
ENLARGING/ REDUCING SECTION
ENLARGING/ REDUCING SECTION
ENLARGING/ REDUCING SECTION
BASE LAYER REFLECTION READ DATA
EMULSION SURFACE REFLECTION READ DATA
TRANSMISSION READ DATA
GRADATION CONVERSION CHARACTERISTIC f3 INFORMATION, LIGHT SOURCE CORRECTION INFORMATION
COLOR CORRECTION COEFFICIENT
REFLECTION, TRANSMISSION CONVERSION CHARACTERISTICS f1, f2 INFORMATION
CONTROL SECTION (SET UP CALCULATION)
140
ILLUMINATION UNIT LIGHT AMOUNT
LIGHTING TIMES t14, t15, t24, t25
CHARGE ACCUMULATING TIMES t11, t12, t13, t21, t22, t23
REFERENCE DENSITY FOR BRIGHTNESS CORRECTION

FIG. 28

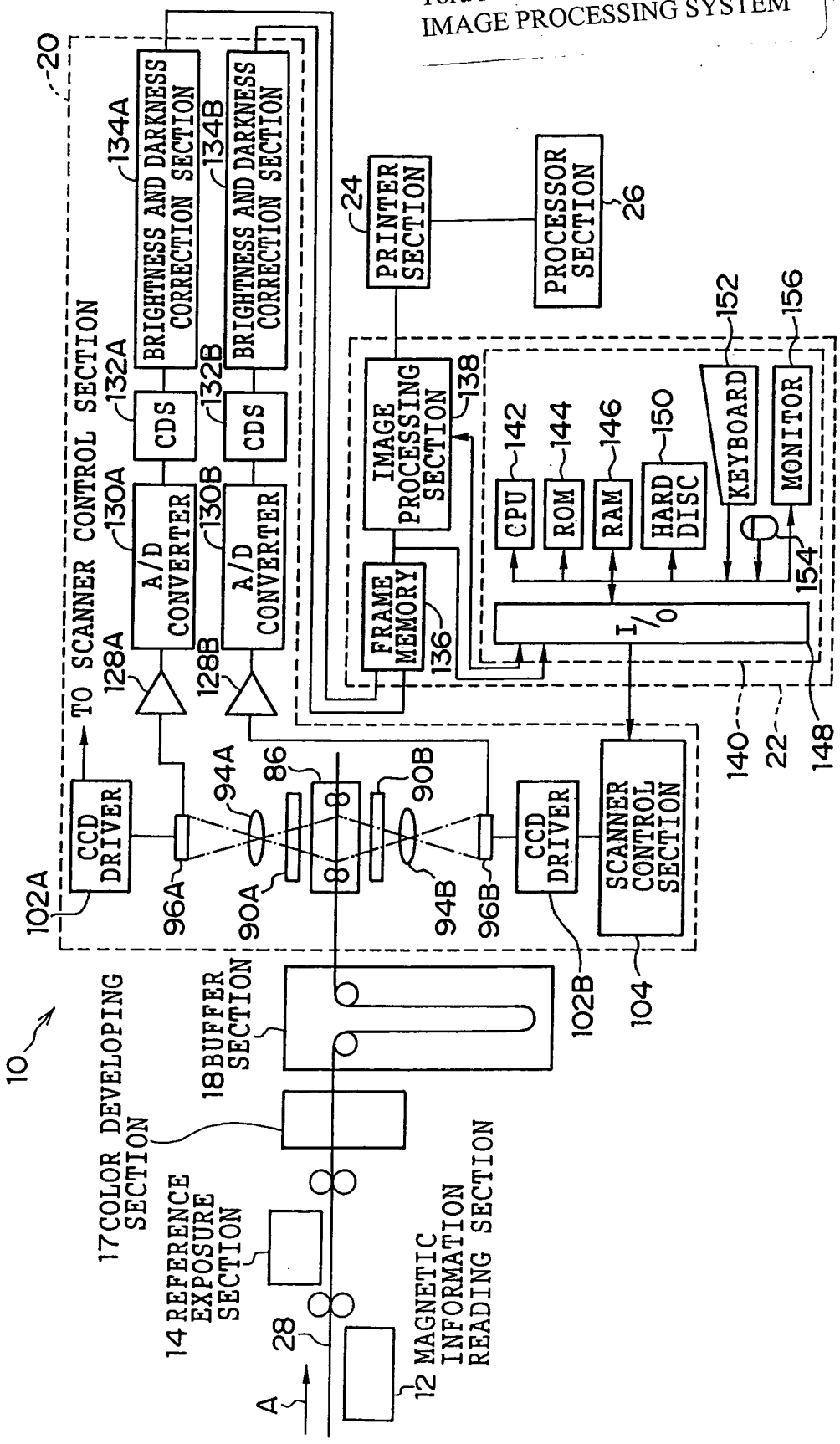

10
12 MAGNETIC INFORMATION READING SECTION
14 REFERENCE EXPOSURE SECTION
17 COLOR DEVELOPING SECTION
18 BUFFER SECTION
20
TO SCANNER CONTROL SECTION
22
24 PRINTER SECTION
26 PROCESSOR SECTION
28
86
90A
90B
94A
94B
96A
96B
102A
102B
104
128A
128B
130A
130B
132A
132B
134A
134B
136
138
140
142
144
146
148
150
152
154
156
A
A/D CONVERTER
BRIGHTNESS AND DARKNESS CORRECTION SECTION
CCD DRIVER
CDS
CPU
FRAME MEMORY
HARD DISC
I/O
IMAGE PROCESSING SECTION
KEYBOARD
MONITOR
ROM
RAM
SCANNER CONTROL SECTION

FIG. 29A

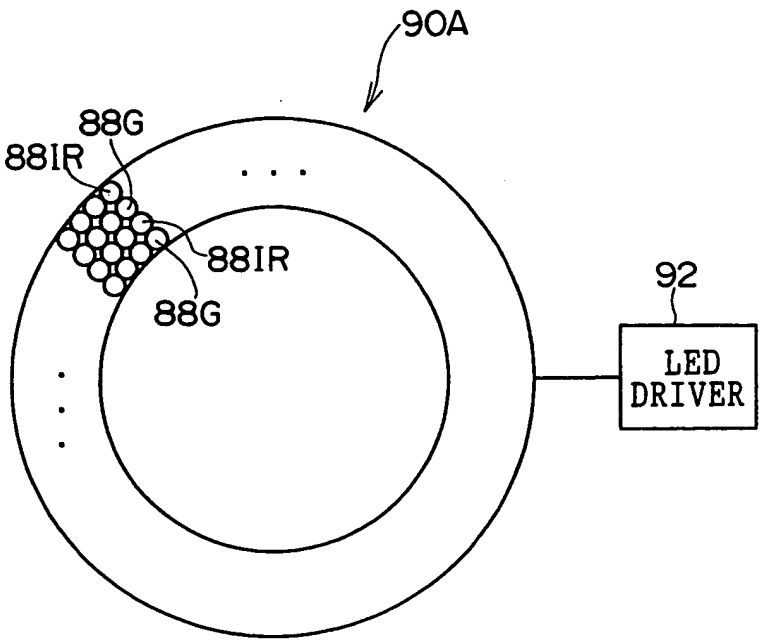


FIG. 29B

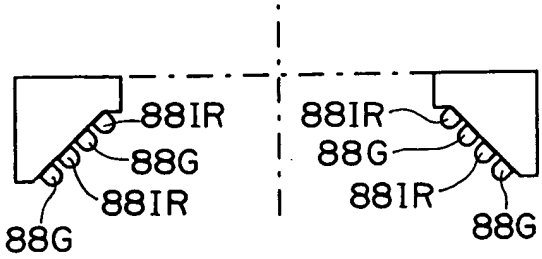
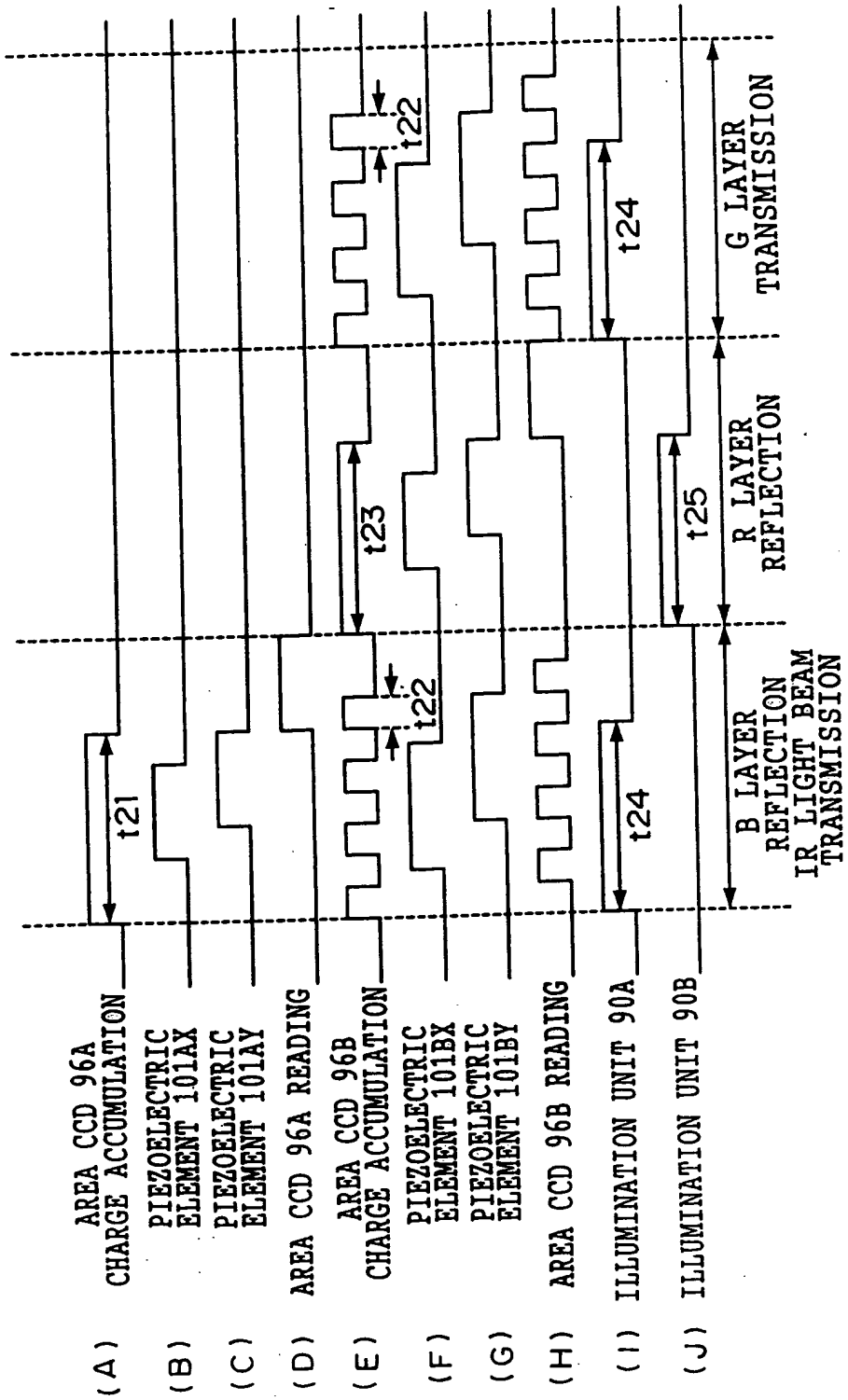


FIG. 30


(A) AREA CCD 96A CHARGE ACCUMULATION
(B) PIEZOELECTRIC ELEMENT 101AX
(C) PIEZOELECTRIC ELEMENT 101AY
(D) AREA CCD 96A READING
(E) AREA CCD 96B CHARGE ACCUMULATION
(F) PIEZOELECTRIC ELEMENT 101BX
(G) PIEZOELECTRIC ELEMENT 101BY
(H) AREA CCD 96B READING
(I) ILLUMINATION UNIT 90A
(J) ILLUMINATION UNIT 90B
t21
t22
t23
t24
t25
B LAYER REFLECTION IR LIGHT BEAM TRANSMISSION
R LAYER REFLECTION
G LAYER TRANSMISSION